PLANNING FOR RURAL BROADBAND

Two Cases of Community-Based Planning and Partnership

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ABSTRACT

High-speed broadband internet is a necessary utility. However, internet service providers are often unwilling to take on the costs of serving rural areas. Federal investments to expand rural broadband have gone underutilized due to insufficient community awareness and planning practices. We explore university–community broadband planning in two rural Florida counties to demonstrate where partnership and local efforts have enabled constructive discussions toward better connectivity. We highlight similarities and differences that inform how the university and residents leveraged community capital, and we explore the planning practices employed in each case. We conclude with recommendations for community-based partnerships for broadband planning in rural communities.
Keywords: broadband, rural, planning, community, university, partnership, communications

High-speed internet service is a necessary utility, yet rural regions tend to have weak broadband infrastructure because many internet service providers (ISPs) are often unwilling to take on the costs of serving distant and sparsely populated areas (e.g., Federal Trade Commission[1]). A costly build-out and a small customer base make rural places unattractive to

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https://doi.org/10.5325/jinfopoli.14.2024.0008

1. Federal Trade Commission, "FTC Sues Frontier Communications for Misrepresenting Internet Speeds: Company Failed to Deliver DSL Internet Speeds for Which Consumers Paid and Were Promised," May 19, 2021, https://www.ftc.gov/news-events/news/press-releases/2021/05/ftc-sues-frontier-communications-misrepresenting-internet-speeds.

broadband service providers.[2] As a result, 19 million Americans lack access to high-speed internet and many more cannot connect due to gaps in equity, literacy, and accessibility.[3] This figure, however, is widely seen as an underestimate of the true problem.

Historically, the Federal Communications Commission (FCC) considered census blocks as served by broadband internet if just one household could "reasonably" be serviced. In urban areas, census blocks are reasonably small. In rural areas, however, census blocks can be hundreds of square miles. This variation resulted in the well-documented practice of overcounting broadband access, especially in rural areas.[4] In November 2022, the FCC made significant changes to its broadband maps that increased the specificity and accuracy of the data. Despite this, access gaps are not the only barrier to rural broadband. Other challenges, such as low population densities, limited local resources, high consumer costs, potentially low return on investment for ISPs, and distances to public wireless access are significant barriers to broadband access in rural communities. Additionally, lower rural broadband adoption rates are likely due to lower average incomes, a higher share of the population that is elderly or disabled, and lower average levels of educational attainment.[5] Rural broadband access and adoption are linked to increased job and population growth, new businesses, higher home values, and technology-infused schools. Unlike many other types of infrastructure, the long-run benefits of broadband access can grow exponentially, given its economic impact potential and community support.[6]

2. Harold Feld, "Solving the Rural Broadband Equation at the Local Level," *State and Local Government Review* 51, no. 4 (2019): 242–9, https://doi.org/10.1177/0160323X20925870.

3. Federal Communications Commission, "FCC Announces Over $640 Million for Broadband Through the Rural Digital Opportunity Fund While Continuing to Strengthen Program," March 10, 2022, https://www.fcc.gov/document/fcc-announces-over-640-million-rural-broadband-26-states; Danielle Hinton, Adi Kumar, Sara O'Rourke, Kunal Modi, Anne Neville-Bonilla, Larry Strickling, and Jon Wilkins, "Are States Ready to Close the US Digital Divide?" June, 1, 2022, https://www.mckinsey.com/industries/public-sector/our-insights/are-states-ready-to-close-the-us-digital-divide#/.

4. Anthony F. Pipa, Laura Landes, and Zoe Swarzenski, "Maximizing New Federal Investments in Broadband for Rural America," May 31, 2023, https://www.brookings.edu/articles/maximizing-new-federal-investments-in-broadband-for-rural-america/.

5. Margaret Reardon, "It Takes a Village: Solving the Broadband Adoption Problem in Rural America," February 23, 2022, https://www.cnet.com/home/internet/it-takes-a-village-solving-the-broadband-adoption-problem-in-rural-america/.

6. Roberto Gallardo, Brian Whitacre, Indraneel Kumar, and Sreedhar Upendram, "Broadband Metrics and Job Productivity: A Look at County-level Data," *The Annals of Regional Science* 66, no. 1 (2021): 161–84, https://doi.org/10.1007/s00168-020-01015-0.

To boost rural economic development, in March 2022, the FCC announced $4.7 billion to extend broadband to the country's unserved and underserved areas, with a particular emphasis on rural communities. To ensure the funding's effective use, the US Congress established the Rural Broadband Accountability Plan (RBAP), a new effort to monitor and ensure compliance for universal service high-cost programs including the Rural Digital Opportunity Fund and Connect America Fund auction. The RBAP made a number of changes and enhancements to existing audit and verification procedures, including doubling the number of audits and verifications, conducting the first on-site audits for the programs, and focusing audits and verifications on the largest winning bidders.[7] Additionally, the Infrastructure Investment and Jobs Act (IIJA) set forth rules for funding programs administered through the National Telecommunications and Information Administration (NTIA), the FCC. These rules set download/upload speed thresholds for unserved communities at 25/3 Mbps and underserved areas at 100/20 Mbps. However, these measures sidestep community-based issues relating to perceptions of need, accessibility, and affordability. Often overlooked is the need to develop and commit to a realistic and inclusive broadband planning process.[8] As the need for rural broadband access continues to grow, we examined two research questions:

1. How does a rural community build the capacity to plan for broadband?
2. How do university/community partnerships contribute to broadband planning?

We investigated these questions through a comparative case study of two university-led outreach efforts to engage rural communities in broadband planning and adoption support.

Literature Review

Broadband refers to high-speed internet connection and takes various forms, such as cable, Digital Subscriber Line (DSL), fiber, satellite, and fixed and mobile wireless platforms. For an internet connection to be considered broadband, the FCC defines the threshold to be no less than 25 Mbps

7. Federal Communications Commission, "Broadband Speed Guide," July 18, 2022, https://www.fcc.gov/consumers/guides/broadband-speed-guide.

8. Kenn Dodson, "Broadband Planning: Who Should Lead, and How?" May 23, 2022, https://blogs.cisco.com/government/broadband-planning-time-to-get-serious.

download and 3 Mbps upload.[9] However, the IIJA metrics are conservative, with the faster threshold of 100 Mbps download and 20 Mbps upload speed still considered "underserved" for today's internet needs.[10]

Importance of Rural Broadband

In rural areas, many individuals lack access to even minimum broadband services at the recommended speeds. However, broadband has myriad benefits to rural communities, such as augmenting economic development, education, health care, public services, and social wellness. Due to their geographic characteristics, many of these aspects become more important in rural communities.[11] Economic development can be expanded through high-speed broadband connections.[12] Entrepreneurs can advertise their businesses to other markets and develop expanded e-commerce solutions. Rural residents working in more traditional workplaces also have the option to telecommute along with their colleagues when they have a high-speed connection. Rural agribusiness is benefited and expanded by broadband access and associated technologies. During the COVID-19 pandemic, the importance of broadband access for school children was heavily underscored. Broadband access correlates with positive educational outcomes and college readiness.[13] For many, telehealth became the only way to receive health care during the pandemic. In areas where broadband access was unavailable, many patients could not see providers who had switched to mostly online care.[14] Telehealth also reduced wait times and the risk of exposure during the pandemic.[15]

9. Federal Communications Commission, "FCC Announces Over $640 Million for Broadband Through the Rural Digital Opportunity Fund While Continuing to Strengthen Program."

10. Congressional Research Service, 2021: The Consolidated Appropriations Act, 2021 Broadband Provisions: In Brief

11. J. M. Graves, D. A. Abshire, S. Amiri, and J. L. Mackelprang, "Disparities in Technology and Broadband Internet Access Across Rurality: Implications for Health and Education," *Family & Community Health* 44, no. 4 (2021): 257–65, https://doi.org/10.1097/FCH.0000000000000306.

12. Catherine Isley and Sarah A. Low, "Broadband Adoption and Availability: Impacts on Rural Employment During COVID-19," *Telecommunications Policy* 46, no. 7 (2022): 102310.

13. B. Kelley and L. Sisneros, "Broadband Access and the Digital Divides. Policy Brief," December, 2020, http://files.eric.ed.gov/fulltext/ED610063.pdf.

14. N. C. Benda, T. C. Veinot, C. J. Sieck, and J. S. Ancker, "Broadband Internet access is a social determinant of health," *American Journal of Public Health* 110, no. 8 (2020): 1123–5, https://doi.org/10.2105/AJPH.2020.305784.

15. Whitney E. Zahnd, Nathaniel Bell, and Annie E. Larson, "Geographic, Racial/Ethnic, and Socioeconomic Inequities in Broadband Access," *The Journal of Rural Health* 38, no. 3 (2022): 519–26, https://doi.org/10.1111/jrh.12635.

Public services are also enhanced through high-speed broadband connections.[16] Rural residents can reduce the need to travel long distances by paying utilities, renewing driver's licenses, and performing other administrative tasks online. Social connectedness is another important aspect of broadband that should not be overlooked. Residents can chat with long-distance friends and relatives, attend religious services, and improve overall satisfaction through these services.[17]

Adoption Considerations

Improving broadband in rural areas faces economic, structural, and community barriers.

Economic Barriers

Building and expanding broadband infrastructure in rural areas can be costly due to large geographic areas and low population densities. Geographic barriers can also increase the cost and complexity of installation. Because many rural areas lack the necessary infrastructure for broadband, such as existing fiber-optic cables or wireless towers, upgrading or building new infrastructure from scratch can be a significant hurdle. The characteristic low population densities and large distances between homes coupled with challenging terrains, such as mountains, forests, or remote locations, make it difficult to deploy broadband infrastructure.[18] Rural communities may have lower incomes on average, making broadband services less affordable for residents. Additionally, the demand for broadband in some rural areas may be lower, further discouraging investment from service providers. The low population density in rural areas makes it challenging to justify the investment in broadband infrastructure. The cost per customer may be higher than in urban or suburban areas, leading to limited interest from service providers. Laying fiber-optic cables or setting up wireless towers over vast distances may not be financially viable for service providers. Service providers often prioritize areas with higher population density because they offer a better return on investment. With their smaller

16. Ben Epstein, "Two Decades of E-government Diffusion Among Local Governments in the United States," *Government Information Quarterly* 39, no. 2 (2022): 101665.

17. S. L. Gatto, and S. H. Tak, "Computer, Internet, and E-mail Use Among Older Adults: Benefits and Barriers," *Educational Gerontology* 34, no. 9 (2008): 800–11.

18. Sharon Strover, "Reaching Rural America with Broadband Internet Service," January 16, 2018, https://theconversation.com/reaching-rural-america-with-broadband-internet-service-82488.

customer base, rural areas may not be financially attractive for private companies to invest in broadband infrastructure. As a result, rural areas often have limited competition among broadband providers, which can lead to higher prices and lower-quality services. The lack of competition reduces the incentive for companies to invest in infrastructure upgrades.[19]

Structural Barriers

Historically, the FCC's maps and data also played a role in underestimating the problem of broadband provision in rural areas. Before November 2022, the FCC considered census blocks as served by broadband internet if just one household or business could "reasonably" be serviced. In November 2022, the FCC made significant changes to its broadband maps that increased the specificity and accuracy of the data. Instead of estimating locations served by broadband if they fall within a census tract, the new FCC maps now account for specific location-level data.[20] This significant change provided more specific data and allowed the FCC and government entities to better understand the problem.

Although this is a significant positive change in how the FCC accounts for lack of access, the new system is not entirely without issues. The information used to create the maps was provided by ISPs who overestimate availability and if locations are "serviced." Additionally, ISPs report advertised speeds, which are often different than the speeds available to subscribers. If the information on the map is incorrect, users and government entities can dispute this information by providing challenges to the accuracy of both the location and its reported service.[21] The challenge process can be a burden to the users as it requires that they both understand and are knowledgeable about the FCC system, further exacerbating the digital divide. Though governments can submit bulk challenges, this may be burdensome to rural counties with limited staff capacity.

Without accurate maps and data on how residents in rural areas are adversely impacted by the lack of available and sufficient high-speed broadband, rural citizens will lack sufficient online connectivity and remain on the wrong side of digital opportunities to ameliorate historic

19. Helen Hambly and Reza Rajabiun, "Rural Broadband: Gaps, Maps and Challenges," *Telematics and Informatics* 60 (2021): 101565, https://doi.org/10.1016/j.tele.2021.101565.

20. Christina Biedny and Brian E. Whitacre, "The Broadband Serviceable Location Fabric, Rural America, and Agriculture," *Choices: The Magazine of Food, Farm, and Resource Issues* 37, no. 3 (2022), https://doi.org/10.22004/ag.econ.329552.

21. Federal Communications Commission, "Broadband Speed Guide."

and systemic inequalities throughout America's rural communities.[22] Regulatory policies and restrictions can hinder broadband deployment in rural areas. Permitting processes, zoning restrictions, and right-of-way issues can slow down or prevent the construction of new infrastructure.

Many rural adoption barriers can be addressed by community-based planning and adoption support to address the digital divide. Digital divide is a comparison term juxtaposing citizens who have access to reliable, fast internet, devices, and digital literacy skills and those who have limited or no access. The underserved and unserved side of the divide disproportionately affects already disadvantaged and marginalized groups, such as Black, Indigenous, and People of Color (BIPOC), as well as women, children, older adults, and people living with disabilities, in low-income, rural areas.[23] The National Digital Inclusion Alliance (NDIA) defined digital inclusion as "the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of Information and Communication Technologies (ICTs)," with five elements: (1) affordable, robust broadband internet service, (2) internet-enabled devices that meet the needs of the user, (3) access to digital literacy training, (4) quality technical support, and (5) applications and online content designed to enable and encourage self-sufficiency, participation, and collaboration.[24] Creating and expanding digital equity is essential for ensuring all people can fully participate in society. It is vital for civic and cultural engagement, social benefits, employment, education, health care, and other essential functions and services.

22. Nicol Turner-Lee, James Seddon, Brooke Tanner, and Samantha Lai, "Why the Federal Government Needs to Step Up Efforts to Close the Rural Broadband Divide. Report #1 of the Rural Broadband Equity Project," October 4, 2022, https://www.brookings.edu/research/why-the-federal-government-needs-to-step-up-their-efforts-to-close-the-rural-broadband-divide/.

23. Kendall Swenson and Robin Ghertner, "People in Low-Income Households Have Less Access to Internet Services," April, 2020, https://aspe.hhs.gov/sites/default/files/private/pdf/263601/Internet_Access_Among_Low_Income.pdf; Andrew Perrin and Sara Atske, "7% of Americans Don't Use the Internet. Who Are They?" April 2, 2021, https://www.pewresearch.org/short-reads/2021/04/02/7-of-americans-dont-use-the-internet-who-are-they/; Michael J. R. Martin, "For the First Time, Census Bureau Data Show Impact of Geography, Income on Broadband Internet Access," December 6, 2018, https://www.census.gov/library/stories/2018/12/rural-and-lower-income-counties-lag-nation-internet-subscription.html.

24. National Digital Inclusion Alliance, "The Words Behind Our Work: The Source for Definitions of Digital Inclusion Terms," August 8, 2022, https://www.digitalinclusion.org/definitions/.

In recent years, the FCC has also moved toward closing the digital divide through subsidies and other programs. During the COVID-19 pandemic, the Consolidated Appropriations Act of 2021 was passed and established an Emergency Broadband Connectivity Fund of $3.2 billion. This helped Americans afford broadband through an ISP, which became an increasingly necessary service during the pandemic. On November 15, 2021, this program was replaced by the Affordable Connectivity Program (ACP), created as a $14 billion program to support low-income households in affording internet service. In July 2021, congress passed the IIJA with $1.2 trillion in total funding. Part of this investment was $65 billion for broadband, and a portion of this amount was specifically allocated for broadband infrastructure. This funding came with several programs including the new Broadband Equity, Access, and Deployment (BEAD) program, overseen by the NTIA. In addition to the BEAD and ACP programs, the IIJA created the NTIA Digital Equity Act Programs (DEA), and the Middle Mile Infrastructure Grant Program. Although funding and affordability are not the only barriers to broadband in rural communities, these grant programs put communities closer to widespread broadband access.[25]

Community Barriers

Rurality, more than household income, racial and ethnic identity, availability, or broadband access elsewhere, seemed to relate to broadband nonadoption.[26] In a study of Florida's rural residents who did not have a broadband connection at home, the most reported reason was that broadband was not needed (47%), a percentage significantly larger than the percentage of rural respondents who reported that a home broadband connection was too expensive, unavailable in their area, or used elsewhere.[27] Although the opinion that broadband is unneeded may have changed after the COVID-19 pandemic, even postpandemic, rural residents are wary of government involvement in financing or providing internet connectivity.[28]

25. Pipa et al. "Maximizing New Federal Investments in Broadband for Rural America."

26. National Telecommunications and Information Administration, *Digital Nation: Expanding Internet Usage.* U.S. Department of Commerce, Washington, D.C., February 17, 2011, http://www.ntia.doc.gov/report/2011/digital-nation-expanding-internet-usage-ntia-research-preview.

27. Marcia A. Mardis, "Beyond the Glow: Children's Broadband Access, Digital Learning Initiatives, and Academic Achievement in Rural Florida," *Journal of Educational Multimedia and Hypermedia* 25, no. 1 (2016): 53–74.

28. Emily A. Vogels, "Some Digital Divides Persist Between Rural, Urban and Suburban America," August 19, 2021, https://www.pewresearch.org/short-reads/2021/08/19/some-digital-divides-persist-between-rural-urban-and-suburban-america/.

Florida's rural residents report a lack of perceived awareness but also suggested that rural community officials and residents often lacked awareness of opportunities to improve their communities' connectivity.[29] Some rural communities lack awareness of the benefits and opportunities provided by broadband access, leading to less advocacy and pressure for improvement. These communities may also not possess the digital literacy skills to understand the pricing or speeds that ISPs advertise. Addressing these barriers requires public and private efforts, including government funding and support, regulatory reforms, stakeholder collaboration, innovative technologies, and community engagement.

Community Broadband Planning

Communities are critical in ensuring their citizens, businesses, and institutions access to contemporary life affordances, including broadband. Community broadband planning should reflect the community's vision for a broadband initiative, the anticipated benefits, and the strategy and action plan necessary to carry out that vision. Communities play a vital role in self-advocating for broadband deployment. Local leaders are ideally positioned to convene stakeholders, assess needs, determine broadband gaps, and leverage assets. Local government and community organizations serve an important role in issuing FCC bulk fabric challenges, coalition building, and advocating for policy changes.[30] The NTIA promotes six strategies for effective community-based broadband planning, regardless of the scale of a broadband project: (1) assemble a team to develop a community broadband vision; (2) assess communities' broadband-related resources, gaps, and needs; (3) engage local stakeholders; (4) choose appropriate technology; (5) select a business or organizational model for

29. Lisandra Carmichael, Charles M. McClure, Lauren H. Mandel, and Marcia A. Mardis, "Broadband Adoption: Practical Approaches and Proposed Strategies for Measuring Selected Aspects of Community-Based Broadband Deployment and Use," *International Journal of Communication* 6 (2012): 2445–66; Mardis, "Beyond the Glow."

30. FCC, "How to Submit a Bulk Fabric Challenge," 2023, https://help.bdc.fcc.gov/hc/en-us/articles/13308560752155-How-to-Submit-a-Successful-Bulk-Fabric-Challenge; Steven J. Jackson and Andrew Gordon, "Building Community Broadband: Barriers and Opportunities for Community-Based Organizations in the Federal BTOP and BIP Broadband Development Programs," *Proceedings of the American Society for Information Science and Technology* 48, no. 1 (2011): 1–11; Carmichael et al. "Broadband Adoption."

the implementation framework; and (6) develop project plans for implementation, sustainability, and other project phases.[31]

These steps are designed to foster a common broadband vision, prioritize needs and interests, and catalyze stakeholder commitment to investing in the needed physical infrastructure, organizational capacity, and human capital assets of the community. A well-designed community broadband plan documents a community's strategic vision and goals; analyzes existing community resources and needs; and guides the strategies to realize this vision. The benefits of developing a community broadband plan go beyond developing a technology plan, business model, or project plan. Community-based broadband planning helps identify new opportunities for partnerships and collaborations that can spur additional businesses, programs, and economic growth. A useful community broadband plan reflects each community's unique priorities, resources, and needs.[32] Although these strategies involve a range of stakeholders, specific strategies for recruiting, supporting participant involvement, and conducting plan creation activities are left relatively undefined in toolkits and other documentation.

Rural Community-Based Planning

Definitions of rurality vary across jurisdictions and organizations and can be hard to succinctly explain. Definitions that use population benchmarks can vary from under 2,500 to 50,000 people.[33] The US Census has a more specific definition of rural areas as "open country and settlements with fewer than 2,500 residents," but also defines rural as having "all population, housing, and territory not included within an urban area".[34] Furthermore, the FCC defines rural as "counties with a population density of 100

31. National Telecommunications and Information Administration, "The National Broadband Research Agenda: Key Priorities for Broadband Research and Data," January 19, 2017, https://www.ntia.doc.gov/files/ntia/publications/nationalbroadbandresearchagenda-jan2017.pdf.

32. Jed Pressgrove, "The Dos and Don'ts of Community Broadband Network Planning," Government Technology 2019.

33. USDA, "Rural Classifications: Overview," 2019, https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/#:~:text=rural%20towns%20(places%20with%20fewer,market%20areas%20(metropolitan%20areas).

34. US Census, "Urban and Rural," 2023, https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html#:~:text=The%20Census%20Bureau%20delineates%20urban,included%20within%20an%20urban%20area.

persons or less per square mile."[35] States can also have their own varying definitions. Florida, where the later discussed university partnership takes place, defines a rural county as a county with a population of 75,000 or less, or 125,000 or less which is contiguous to a county with a population of 75,000 or less, as well as any municipality in one of these designated areas (FL State Statute, Section 288.0656).

Such attempts to define rural areas tend to classify them simply as "not urban" and focus on their perceived lack. These vague or varying definitions can make it difficult to determine if communities are eligible for certain programs and grants. For example, the IIJA does not specifically prioritize rural areas for funding, but instead prioritizes "high-cost areas." Rural communities are not monolithic; they have diverse industries, geographies, cultures, and people. These practices of vague definitions also result in categorizing rural communities by their challenges, not their strengths, and obscuring their varied realities. Rural communities have much more than they need.[36] By better understanding rural community strengths, local policymakers and regional partners can build on a community's potential to better target investment and support. Local leaders and citizens seek coherent means to address their communities' various challenges. In many respects, most community and economic development initiatives intend to advance an area's "quality of life." High quality of life results from many intersecting aspects of access, including skill, policy, and need.

University Partnerships

Relationships between universities and local communities have a significant history dating back to the 17th century, if not earlier.[37] These relationships center on the idea that partnerships between universities and their surrounding communities can be mutually beneficial when students and academia are engaged appropriately. The appropriateness of this

35. FCC, "Notice of Proposed Rulemaking," FCC 03-222, 2003, https://docs.fcc.gov/public/attachments/FCC-03-222A1.pdf#:~:text=We%20propose%20that%20%E2%80%9Crural%E2%80%9D%20counties%20be%20defined,persons%20per%20square%20mile.89%20For%20example%2C%20if.

36. Wesley Jenkins, "Reenvisioning Rural America: How to Invest in the Strengths and Potential of Rural Communities," September 21, 2021, https://reenvisioning-rural-america.urban.org/.

37. Ira Harkavy and Lee Benson, "De-platonizing and Democratizing Education as the Bases of Service Learning," *New Directions for Teaching and Learning* 1998, no. 73 (1998): 11–20, https://doi.org/10.1002/tl.7302.

relationship centers on several factors including the quality of engagement, the length of time of the partnership, and the connectedness the community feels to the university partner.[38] Historically, these relationships were often unproductive and one-sided, but newer theories of interaction have resulted in more productive ways to balance these relationships.[39] When enacted appropriately, this community-based research results in benefits for both parties.[40]

Universities receive several benefits from strong community relationships. Students receive "real-world" experience in community engagement that complements the theory they are learning in their coursework. Additionally, the university may receive more favorable public opinion and marketing benefits. The community receives benefits in several ways. Oftentimes, universities can provide services in-kind or at discounts that for-profit entities would offer at much greater expense. The community may also receive a sense of greater connectedness to the university. Members of communities who engage in these partnerships may feel more interest in attending cultural, intellectual, athletic, and artistic offerings from the universities and may feel more favorably toward the university after doing so.[41] Rural communities can also benefit from greater human capacity or organizational capacity that they would otherwise not possess.

Applied research benefits both the university and the communities. The university benefits from valuable case studies and publishable data while the community can see gains in myriad areas including community development, economic development, public health, planning, education, and other fields. Both entities gain new insights and perspectives in a variety of aspects.[42]

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38. Beth M. King, Shirley C. Gordon, Charlotte D. Barry, Rhonda Goodman, Laura T. Jannone, Marie Foley, Cheryl Resha, and Candace Hendershot, "Town & Gown: Building Successful University-Community Partnerships," *NASN School Nurse* 32, no. 1 (2016): 14–18, https://doi.org/10.1177/1942602X16681819; Lawrence L. Martin, Hayden Smith, and Wende Phillips, "Bridging 'Town & Gown' Through Innovative University-Community Partnerships," *The Innovation Journal: The Public Sector Innovation Journal* 10, no. 2 (2005): 1–5, https://innovation.cc/wp-content/uploads/2005_10_2_3_martin-smith-philips_partnerdships.pdf.

39. Stephen D. Bruning, Shea McGrew, and Mark Cooper, "Town–Gown Relationships: Exploring University–Community Engagement from the Perspective of Community Members," *Public Relations Review* 32, no. 2 (2006): 125–30, https://doi.org/10.1016/j.pubrev.2006.02.005.

40. Laura Ryser, Sean Markey, and Greg Halseth, "Developing the Next Generation of Community-Based Researchers: Tips for Undergraduate Students," *Journal of Geography in Higher Education* 37, no. 1, (2013): 11–27, https://doi.org/10.1080/03098265.2012.696596.

41. Bruning et al. "Town–Gown Relationships."

42. Francisco Ibáñez-Carrasco and Pilar Riaño-Alcalá, "Organizing Community-Based Research Knowledge Between Universities and Communities: Lessons Learned," *Community Development Journal* 46, no. 1 (2011): 72–88, https://doi.org/10.1093/cdj/bsp041.

Method

In this section, we report the study's design, data collection, and data analysis.

Comparative Case Study Approach

Comparative case study research is a qualitative method that involves comparing multiple cases to gain a deeper understanding of a phenomenon or to explore differences and similarities across cases. This method allows researchers to analyze and interpret data from different cases to identify patterns, themes, and relationships. Case study research is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not evident"[43] and provides a valuable approach to understanding complex social phenomena and exploring the impact of policies and practices in various fields of social research.[44]

Comparative case studies involve analyzing and synthesizing the similarities, differences, and patterns across two or more cases that share a common focus or goal. Comparative case studies usually utilize qualitative and quantitative methods. They are particularly useful for understanding how the context influences the success of an intervention and how better to tailor the intervention to the specific context to achieve the intended outcomes. We chose this method to highlight how local factors affect community decision-making processes and outcomes.

Yin advised that comparative case study research involves selecting cases that are similar in some respects but differ in others, allowing for meaningful comparisons and analysis.[45] Researchers can use various data collection methods, such as interviews, observations, and document analysis, to gather rich and detailed information about each case. In our study, we define our cases by the county in which the community-based planning occurred, Forest County and Beach County, and the project phase within each county. Beach County included Phase 1, and Forest County included Phase 2, elaborated in the following sections.

43. Robert K. Yin, *Case Study Research: Design and Methods* 5th ed. (Thousand Oaks, CA: Sage Publications, Inc., 2014), 16.

44. L. Bartlett and F. Vavrus. *Rethinking Case Study Research: A Comparative Approach* (Abingdon-on-Thames: Routledge, 2016).

45. Yin, *Case Study Research*.

Sites and Participants

We gathered the experiences of two adjacent rural counties in the Florida Panhandle participating in a two-phased community-based broadband planning effort. The participating sites included Beach, a seaside county, and Forest, an inland county. These counties were chosen for the study due to their formal relationship with a regional planning council and their receipt of grant funds from the Florida Department of Commerce (formerly the Department of Economic Opportunity). To maintain confidentiality, pseudonyms are used for the county names and all quoted personnel. Cases reflect a collaborative relationship between a regional planning council, two teams of urban planning studio students, and a locality's citizens and leaders. Each case study in the Results section details participants and procedures specific to community engagement and broadband planning efforts.

Florida Statutes define a rural county as a county with a population of 75,000 or less, or 125,000 or less, which is contiguous to a county with a population of 75,000 or less, as well as any municipality in one of these designated areas (FL State Statute, Section 288.0656). Forest County, to the west, and Beach County, to the east, meet these criteria and are contiguous, though separated by a river. Both subject counties are classified as rural but have very different population sizes, regional connectivity, baseline availability of broadband, and access to resources.

Beach County has a population of approximately 35,000. Its county seat is 78% White and 12.5% Black. Due to its coastal location adjacent to the state capital, it has a unique development pattern including a mix of traditional coastal towns, rural enclaves, and more recently developed commuter-based bedroom communities for the nearby state capital in Tallahassee.[46] Beach County has areas that are relatively urbanized and easy to access but also has some settlements in more remote wilderness areas; these differences create the need for very different outreach approaches.

Forest County has a population of just under 8,000, making it one of the least populated in Florida. The county is 72% White and 17% Black. Much of the county's land area is covered by a national forest, which creates a barrier to connectivity. With a per capita income of $17,003, economic

46. United States Census Bureau [Census], "QuickFacts: Wakulla County, Florida," July 1, 2022, https://www.census.gov/quickfacts/fact/table/wakullacountyflorida/PST045222.

TABLE 1 Broadband access and subscription, Florida and Forest and Beach County

Broadband Availability	**Florida (%)**	**Beach (%)**	**Forest (%)**
Households with subscription	83	79	67
Low-income households with subscription	67	66	51
Non-White households with subscription	83	64	73

Source: United States Census Bureau [Census]. "Mapping Digital Equity in Every State." May 13, 2022. https://www.census.gov/library/stories/2022/05/mapping-digital-equity-in-every-state.html.

development is a significant concern.[47] This less populated county, Forest, has its own unique connectivity challenges. Although it is one of Florida's largest counties in terms of land area at 864 square miles, it has one of the state's smallest populations. Florida averages 417 residents per square mile, but since nearly two-thirds of Forest County is federal-, state-, or privately owned forest land, its population density is only 12 people per square mile.[48] Forest County is further behind state and local subscription rates, as shown in Table 1.

As Table 1 indicates, Florida's home broadband subscription rate is high, but a closer look suggested that low-income households had fewer subscribers. Although Beach County largely reflects overall statewide subscription trends, it also has fewer subscribers from low-income and non-White households. Forest County has an overall lower subscription rate, with precipitous dips in low-income household subscribership: only about half of that county's households have broadband. Non-White household subscribership was stronger, however, with nearly three-quarters having broadband.

Institutional Context and Project Phases

The Florida Office of Broadband was established in 2020 to promote and expand broadband coverage statewide through grants and other types of support. In early 2021, a regional planning council in Florida began working with rural Beach and Forest counties to prepare Rural Infrastructure

47. United States Census Bureau [Census], "QuickFacts: Liberty County, Florida," July 1, 2022, https://www.census.gov/quickfacts/libertycountyflorida.

48. Ibid.

Fund grants to develop broadband feasibility studies. Upon being awarded these grants, the regional planning council contracted with a nearby university to engage graduate students during the Spring and Summer 2022 terms to conduct a two-phase planning effort, one phase in each county. Phase 1 of the project was conducted by a team of 10 students under the direction of two university faculty members over the course of a standard, 16-week semester. Spring 2022, Phase 1, included Beach County developing a Market Analysis Survey and Recommendation Reports to document existing conditions and assess community needs. In Phase 2, the team was composed of five students whose work was compressed into a much shorter 13-week, summer semester. All students were part of a mandatory capstone course that is practically focused and serves as a bridge from academia to a professional work environment. In Summer 2022, Phase 2, the student team expanded upon the recommendation reports to include proposed implementation strategies. After the student portion of the project was completed, university staff finalized the broadband feasibility reports for each county based on client and community feedback.

The two-phased approach engaged urban planning graduate students in a learning lab environment to build the technical, analytical, and outreach skills necessary for them to succeed in their careers. The use of graduate students as the primary consultants to these rural communities offers an array of direct and indirect benefits to the communities, the students, and the planning profession.

Comparative Case Study Data Collection

The purpose of the multicomponent and multiphased project described here was to provide the Florida counties, Beach and Forest, with background research on their existing broadband capabilities and needs, as well as a range of implementation strategies to support the development of future implementation plans and grant applications. We collected artifacts from case studies centered on two rural counties in North Florida; the combination of county and Phase 1's artifacts included the market survey and Beach County report. Phase 1, Beach County, included the development of educational materials, community outreach events, survey data collection, and reporting to the respective boards of commissioners. Through outreach and surveying, the Phase 1 team collected data on existing community characteristics, resources, capabilities, and infrastructure needs. These efforts led to developing a market analysis survey and

recommendation reports, which provided a snapshot of existing conditions and a preliminary summary of the community's desires.

Phase 2's artifacts included expanded recommendations and implementation strategies for Forest County. The Phase 2, Forest County, team finalized the work of the Phase I team and developed "how to" outreach materials to inform the county governments on best practices for continued engagement and the development of Local Technology Planning Teams (LTPTs), which are state-mandated steering committees. The initial role of faculty was to support both teams in understanding their scopes of work, developing a division of labor and project work plan, and ensuring that time-critical benchmarks, like public meeting notices and deliverable due dates, were met. The faculty guided the efficient project completion as defined in the student work plans and reviewed and refined project deliverables.

The market analysis survey, recommendations report, and the final broadband feasibility reports were structured for integration: introduction and project background; presentation of broadband alternatives; barriers and limitations to broadband implementation; and next steps for project implementation. The second set of reports, building upon the foundation of the market analysis, included more in-depth coverage of community survey methods and findings, a reclassification of the "alternatives" into administrative approaches and implementation strategies, and cost estimates for the alternative implementation scenarios. Each report also included appendices of maps on county-specific demographics, survey results, and cost estimates, as well as outreach materials and references.

Comparative Case Study Analysis

In community-based broadband planning, comparative case study analysis involves comparing different communities' experiences and approaches to broadband planning and implementation. This method allows researchers and policymakers to gain insights into what worked well and challenges faced in different communities to inform future planning efforts. The analysis began by examining each county's data and project artifacts (e.g., market analyses, implementation strategies, and final reports). We aimed to establish a comprehensive understanding of the broadband planning process, challenges faced, strategies employed, and outcomes achieved in each community, and a sense of how the cases were similar and how they differed.

We then compared the findings across the two cases, identifying patterns, themes, and commonalities and analyzing the factors contributing to success or hindering progress in each community. We analyzed the case examination by categorical attributes (e.g., leadership, level of community ownership, community stability), focusing on the relationships between planning team activities and outcomes. By examining similarities and differences, researchers can identify best practices, lessons learned, and potential strategies that can be applied in other communities.

Comparative Case Study Findings

This section describes activities common to both phases' efforts, followed by an in-depth look into each county.

Common Activities

The project teams conducted community outreach events in Spring 2022 and Summer 2022. The project teams developed a three-component approach for gathering community feedback to understand the coverage and quality of current broadband internet services provided in the two counties and to evaluate community needs. This approach included collecting survey data, in-person public engagement (mandatory meetings with elected officials), and web-based project status reporting.

Surveys

The student project teams used community surveys as a primary form of community feedback. In developing the broadband feasibility surveys featured in the Appendix, the teams referenced existing state documentation and feasibility studies conducted in rural Florida communities and other areas with low population densities for guidance. The survey's main purpose was to determine areas in each county without broadband access; internet speeds and reliability in the county; information about the respondent's current ISP; respondents' degrees of satisfaction with their internet service; and demographic information.

Team members distributed the community surveys to residents of both counties online and in person. The survey's online version was delivered through flyers with a scannable QR code and link, while the survey was administered in -person at public workshops and through the United States Postal Service (USPS) Every Door Direct Mail (EDDM) service.

Those who received the mailers could complete the survey online with a QR code or link or were instructed to complete it on paper and drop it off at a specific location where the research team could collect it at the end of the survey window. Due to potential digital literacy and equity disparities, such as no access to an internet connection or confusion about using the QR code, the online survey was also condensed and administered in person to county residents at various locations. The research team also offered to read the survey aloud to individuals to eliminate accessibility issues with print size or literacy.

Community Meetings

The student teams engaged with community members through official meetings held in public facilities, at other venues such as at planned festivals, and through pop-up opportunities, such as contacts with residents at local businesses. The intention of conducting outreach in these various locations was to cover a broad geographical area and diverse population and to foster more personal and comprehensive discussions about the project. Each engagement session was publicly noticed on county websites, in local newspapers, and through postings in public spaces. In each setting, students provided public outreach materials on broadband, answered residents' questions, and administered the survey. The multifaceted outreach campaign intended to ensure that no group of residents was missed. These efforts yielded highly successful feedback, enabling the research team to have one-on-one, in-depth conversations about residents' concerns with broadband access and implementation.

Online Status Updates

The final method of engaging residents was through an online tool, ArcGIS Story Map,[49] regularly updated with results from the various outreach efforts. The projects' ArcGIS Story Maps combined text, images, maps, and other forms of multimedia to create immersive views of the planning efforts. Through these methods of community engagement, data were collected on current broadband needs in the two counties and informed the implementation strategies, administrative approaches, and scenarios presented in the project report.

49. https://storymaps.arcgis.com/stories/be4a6def28ab408e8b2a135a6d710438.

Strategy Development

The broadband implementation scenarios for both counties were developed through an iterative process. Initial strategies were developed by the students during Phase 1. The Phase 2 team further refined through additional research and community engagement. In Phase 2, the students presented their ranked recommended alternatives of broadband deployment strategies to the Board of County Commissioners in both counties. The final feasibility report highlights each county's preferred and recommended alternative.

The student teams analyzed potential alternatives from two perspectives. The first covered administrative strategies and included a review of public–private partnerships, public-led initiatives, or private sector–led solutions. The second dimension consisted of technical implementation strategies and included the options of anchor sites, hybrid fiber with fixed wireless, and fiber-to-home alternatives.[50] Anchor Sites refer to sites where Community Anchor Institutions (CAIs) such as libraries, schools, hospitals, and public services have or could be fitted with enterprise-grade internet that the public could connect to. Hybrid fiber refers to broadband connections using a mix of fiber-optic cable connection and a coaxial cable for last mile connection. Finally, fiber to home is the highest-cost alternative and involves running fiber-optic cable to individual homes and businesses. This varied approach allowed the students to evaluate each alternative within these dimensions as well as within the specific needs of each county and offered the most feasible technical solution paired with the most likely to occur administrative approach.

In developing their recommendations for each county, the students conducted a detailed analysis of existing broadband infrastructure by examining published research and reports reflecting existing infrastructure across the United States. They then designed solutions to fill coverage gaps, including adding additional towers, expanding the existing fiber backbone, and fiber connection to homes. This allowed them to develop scenario-based alternatives for the three technical strategies: anchor sites, hybrid fiber with fixed wireless, and fiber to home. Throughout

50. The Infrastructure Investment and Jobs Act (IIJA) requires that fixed wireless connection use licensed spectrum or spectrum that is exclusively assigned to operators and licensed by the FCC. Licensed spectrum has reduced interference and increased reliability and performance.

the process, the student team members provided a description of each strategy area, a discussion of its strengths and weaknesses, and a relevant case study. They then developed one or more cost-based scenarios for each technical solution, along with recommendations for both the technical strategy and specific cost-based scenario that they believe would best meet the county's needs. Cost was not the sole factor in the students' prioritization of alternatives; the unique needs of the county, feedback from residents, and feedback from elected officials all influenced the selection of the recommended solution. These recommendations were presented to the elected officials in a public meeting for review and feedback.

Case Findings

The next section will synthesize the results of these activities in the context of each county and then present comparisons.

Beach County Findings

Beach County is the larger and more urbanized of the two rural counties for which the student teams developed broadband planning materials. While Beach County reflects the statewide broadband trends in Florida, it has fewer subscribers from low-income and the lowest percentage of minoritized households (64%) of the two study counties.

Beach County Community Outreach

To better understand the needs of county residents, the student teams launched a project survey (featured in the Appendix) between January 21, 2022, and July 23, 2022. To advertise the online survey, the student teams shared QR codes and website links to Facebook pages for local governmental agencies and elected officials and in community stakeholder Facebook groups, such as "Beach Citizens" and "Beach County Moms." Students distributed flyers with QR codes and links throughout Beach County at local businesses, government buildings, and high school sporting events. The goal of the survey deployment was for broad coverage across many different locations and venues to help guarantee a wide selection of residents from all over the county. Tabling events were hosted in multiple locations and venues, including a local Goodwill, the Beach County Public Library,

the Piggly Wiggly grocery store, and local festivals. These events differed from the Phase 2 team's publicly noticed workshops in a more structured setting, with supplemental materials and activities to discuss the project.

Seven publicly advertised workshops were held in the county throughout the project. The purpose of the first four workshops was to obtain data about community needs, while the last four were to solicit feedback on the broadband alternatives that the student team developed from research on existing conditions and stakeholder input. The eighth and final meeting was led by faculty after the end of the summer semester and presented the broadband alternatives and scenarios to the Board of County Commission (BOCC) for approval. The engagement sessions were in one of two formats: mobile workshops or formal meetings, some of which were with the Board of County Commissioners.

The workshops were held at two community centers, a brewery, a county commission meeting, a fishing tournament, a Fourth of July parade festival, and a cafe in the south of the county. The intent of hosting public workshops in these diverse locations was to cover a broad geographical area and a diverse population and to foster more personal and comprehensive discussions about the project. Each engagement session was publicly noticed through the *Beach Sun* newspaper and the *Beach News* media sources and advertised through social media platforms, specifically community Facebook groups.

Beach County Survey

As of July 23, 2022, the Phase 2 team's broadband feasibility survey for Beach County received 338 responses, exceeding the target goal of 300. Surveys were advertised online through websites for the Beach County Commission, the *Beach News*, the *Beach Sun*, and Facebook community groups and approximately 940 survey flyers were distributed to government buildings, schools, and businesses in the county. Additionally, the research team was physically present in the county tabling and conducting workshop events on 16 different occasions. Key findings from the survey include:

- The primary types of internet service were DSL and cable internet.
- Most respondents (54%) paid between $50 and $100 for their internet.
- The county has two primary ISPs.
- Only one-third of residents meet the minimum 25 Mbps upload speed for broadband.

- The speed of internet service is the primary reason for dissatisfaction with an internet connection, not the cost.

These survey results provided a snapshot of the state of internet connectivity in Beach County. They showed that most respondents are dissatisfied with their internet service, indicating room for improvement. Looking at the respondents' recorded internet satisfaction and upload speeds, in relation to the costs they pay for that service, shows these individuals typically pay higher subscription costs than those in areas with higher broadband provision without receiving the same quality of service.

Beach Case Study Conclusions

In an analysis of existing capabilities, the Phase 1 team identified and mapped existing fiber and cell tower infrastructure in the county and potential sites that could be converted to serve as anchor point locations for accessing high-speed internet. In Beach County, the team identified eight existing cell towers, mapping coverage areas of 10 miles in radius and existing fiber lines following the major roadways in Beach County, specifically Beach County Highway running north to south through the middle of the county. They were then able to identify 40 potential anchor point sites, including public community infrastructure, such as schools, hospitals, libraries, and fire stations, which could be converted to community anchor point sites to allow residents access to broadband by updating internet packages with ISPs or bringing the internet to facilities currently lacking service. Following a uniform process, the students could present a range of specific scenarios within the three technical strategies (anchor sites, hybrid fiber with fixed wireless, and fiber to home). For Beach County, the students presented four cost-based scenarios for anchor sites, three for hybrid fiber, and one for the fiber-to-home alternative. The team further determined that for Beach to operationalize these solutions, the County needed to release a request for quote (RFQ) or request for information (RFI) to identify potential providers to enter a public–private partnership to share the cost of implementing their plans. Following this step, grant funding opportunities could be explored.

Forest County Findings

Forest County is the smaller, more rural of the two rural counties for which the student team developed broadband planning materials. Forest County

lags significantly behind the state average regarding households with broadband subscriptions and low-income and minoritized households. The percentage of low-income households with a broadband subscription in Forest County is 51%, a low percentage compared to Florida and the more urbanized Beach County.

Forest County Community Outreach

To better understand the needs of county residents, the Phase 2 student team launched the project survey on January 21, 2022, and concluded it on July 23, 2022. The team conducted outreach similarly to how it was conducted in Beach County, with a few distinct differences. EDDM service from the USPS was utilized more in Forest County due to the extremely rural nature of the county and the large swaths of forested land. The distributed nature of the county's residents made it more difficult to find and locate centralized meeting places in the county. Instead, the Phase 2 team identified the county areas least accessible by car with the lowest population densities and targeted those areas through the EDDM postal route tool. Respondents were encouraged to either complete the survey online or return the survey at an in-person drop-off location in the county seat.

The Phase 2 team conducted five publicly advertised workshops throughout the project. The first three workshops' purpose was to obtain data pertaining to community needs, while the purpose of the fourth and fifth meetings was to present the broadband alternatives and scenarios to the BOCC for approval. The engagement sessions were in one of two formats: mobile workshops or formal meetings. The locations for the workshops were held in school board offices, the public library, and the BOCC chamber. The Phase 2 team hosted the workshops in various locations across the county to cover a broad geographical area and diverse population and foster more personal and comprehensive discussions about the project. Each engagement session was publicly noticed through the *Forest Journal* and the *Forest News* media sources and advertised through social media platforms, specifically community Facebook groups. A specific difference between outreach in Forest County was the collaboration between the research team and the county government. The Forest County School Board and superintendent worked alongside the Phase 2 student team and co-advertised meetings, even scheduling workshops directly following school board meetings so community members were already present. Siting meetings in this location also lent the research team much trust and legitimacy since the county superintendent was a well-respected public figure.

Forest County Survey

The Phase 2 team's broadband feasibility survey for Forest County received 119 responses, exceeding the target goal of 100. Surveys were advertised online through websites for the Forest County Commission, the Forest County School Board, the *Forest News Journal,* and Facebook community groups and through approximately 1,300 survey flyers distributed to government buildings, schools, and businesses in the county. Additionally, the research team was physically present in the county tabling and conducting workshop events on eight different occasions.

Key findings from the survey included:

- The primary types of internet service are DSL and cable internet.
- Most respondents (65%) paid between $50 and $100 for their internet.
- The community has only one primary ISP.
- Most respondents (75%) said their current internet service does not meet their needs.
- Only 28% of respondents met the minimum 25 Mbps upload speed for broadband.
- The internet speed and lack of reliability are the primary reasons for dissatisfaction with internet connection, not the cost.

These survey results provide a snapshot of the state of internet connectivity in Forest County. The findings show that most respondents are dissatisfied with their internet service, indicating significant room for improvement. The respondents' recorded internet satisfaction and upload speeds, in relation to the costs they pay for that service, show these individuals typically pay higher subscription costs than those in areas with higher broadband provision without receiving quality service. Forest was different from Beach in overall internet satisfaction and reliability, likely due to the forested nature of the county and amount of satellite subscribers. These findings also echoed the analysis supported by the 2019 data featured in Table 1. Broadband provision in Forest County was low and trailed behind both Beach County and Florida.

Forest Case Study Conclusions

In an analysis of existing capabilities, the students identified and mapped existing fiber and cell tower infrastructure in the county and potential sites that could be converted to serve as anchor point locations for accessing high-speed internet. In Forest County, the team identified five existing

cell towers, mapping coverage areas of 10 miles in radius and existing fiber lines totaling about 179 miles of fiber, mostly on roadways to the east and west that cut through the national forest located within the county. They then were able to identify 30 potential anchor point sites, including public community infrastructure, such as schools, hospitals, libraries, and fire stations, which could be converted to community anchor point sites to allow residents access to broadband by updating internet packages with ISPs or bringing internet to facilities currently lacking service.

Following a uniform process, the students could present a range of specific scenarios within the three technical strategies (anchor sites, hybrid fiber with fixed wireless, and fiber to home). For Forest County, the students presented three cost-based scenarios for anchor sites, three for hybrid fiber, and one for the fiber-to-home alternative. Based on feedback from County Commissioners and other stakeholders, the Phase 2 team recommended that Forest County immediately identify areas of interest for anchor point implementation; move toward a hybrid network in a phased approach; and pursue grants and partnerships for future network expansion. The Phase 2 students determined that, due to the overall lack of internet coverage throughout Forest County, the first step should be identifying anchor sites for implementation. For equity considerations, this will allow for providing internet as quickly as possible to underserved and unserved areas that are most needed. This option is the quickest and relatively low-cost option to move forward with compared to alternative scenarios. After establishing a greater network of connections through anchor points, the county could expand the hybrid network with an ISP and apply for grant-based funding for the fiber expansion.

Discussion

This study of two rural community broadband planning cases centered on two questions.

1. How Does a Rural Community Build the Capacity to Plan for Broadband?

To date, rural communities face myriad barriers to improving their broadband connectivity, ranging from a lack of accurate maps and data to concern about government involvement and low awareness. In Florida, pursuant to State statute (Section 288.9961(4)(b), Florida Statutes), the

Broadband Office is charged with helping to build and facilitate LTPT. These teams are designed to be representative of the community, with representatives from the public and private sectors. The expectation is that every county, regardless of size, will develop an LTPT to help guide broadband planning. The LTPT process is a nine-step process guided by Broadband Community Planning toolkit, as featured in Figure 1.

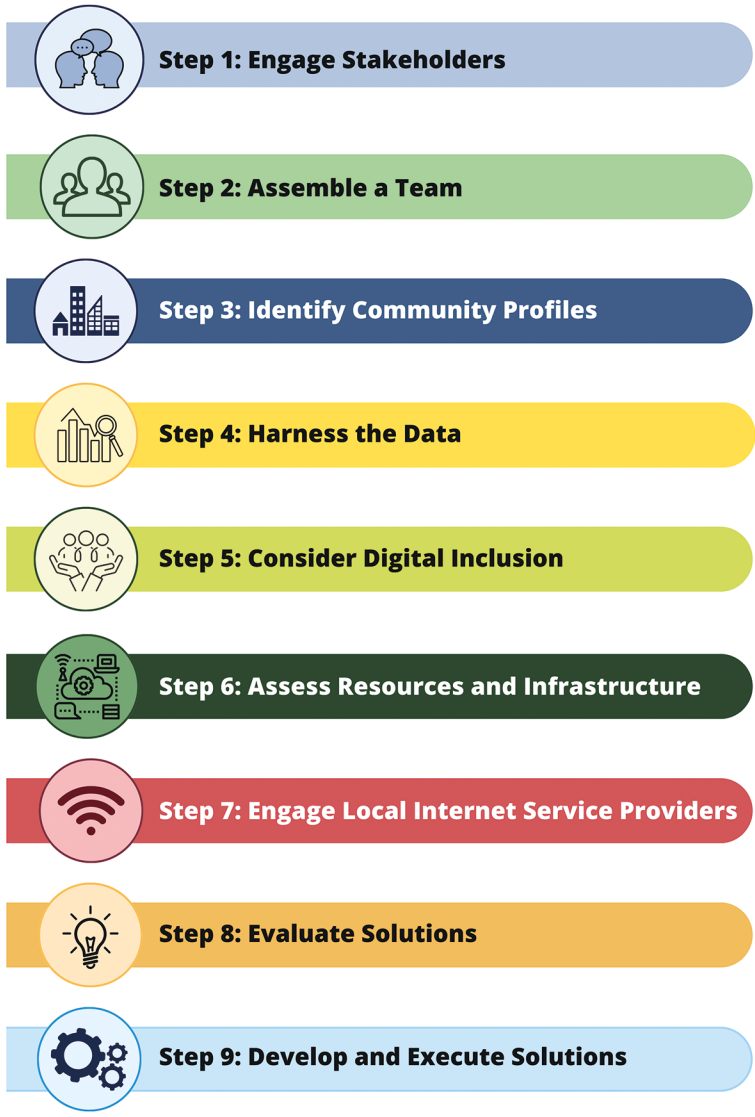

FIGURE 1 Nine-step local technology planning team process included in Beach County Feasibility Study (Adapted from Florida Department of Economic Opportunity 2022).

As Figure 1 shows, the toolkit provides steps to guide LTPTs and contains community and business survey templates and other fundamental resources. Although developing a group like the LTPT could help ensure community engagement in broadband planning, LTPTs do not necessarily build capacity to plan for broadband. In many rural communities, including Beach and Forest counties, the creation of citizen input groups like these draws from a limited population, especially in areas requiring technical expertise like broadband. Sometimes different citizen groups or organizations in rural areas are composed of many of the same residents or elected and appointed officials, limiting the individual's available time or capacity. Because the number of people with expertise in broadband is limited, those knowledgeable may also be overrepresented by vendors or salespeople with a financial incentive for promoting various alternatives, products, or providers.

Student research team-created documents like the Community Outreach How-To Guide: Best Practices for Conducting Rural Community Outreach and the LTPT Progress Reports for the counties can serve as important resources for community members or county governments that want to be better prepared for accessing grant funding and other legislation on its way down the pipeline. The step-by-step LTPT Progress Reports created a framework that any county in Florida can apply to determine the next steps, read helpful policy planning tips, or report on their status for grant applications or the FL Department of Economic Opportunity's legislative priorities. The student-led mobile-led workshops started with the fundamentals; residents and elected officials were led through broadband definitions regarding connection types, speeds, and importance. Technical assistance was provided to the counties through the identification and mapping of locations and status of lit and unlit fiber. Usually, ISPs consider the information regarding these locations and equipment to be proprietary knowledge. Providing this type of technical assistance to rural counties at low or no-cost increases the literacy of the community in a way that better positions them to seek out resources and levels the playing field for conversations with ISPs.

Outside of the context of a task force to provide guidance, the responsibility to apply for grant funding falls on the often-limited staff of a rural government. Because of capacity limitations, rural counties in Florida typically rely on staff from regional planning councils or private consultants to help support their grant writing capabilities. This is the case for both Forest and Beach Counties. Understanding these limitations, relying on university students as consultants to rural communities may improve a

community's ability to access information regarding broadband solutions, meet their immediate planning and grant writing needs, and build local government and community capacity in this domain. Further, by strengthening the capacity of rural local governments, this model also stands to provide benefits to the students as well as the planning profession.

2. How Do University–Community Partnerships Contribute to Broadband Planning?

Community broadband planning works best as an inclusive process that benefits from additional support and guidance to identify community capital assets and effective use of NTIA's broadband planning best practices. The partnership resulted in broadband planning benefits for the localities as well as the student team members. This study demonstrated that community benefits from university partnerships include:

Cost

Cost is a factor that limits options for rural communities. Limited budgets result in communities making choices regarding essential staffing. Grant writing staff is often limited, as the researchers found in the case of Beach County, or a function that is shared by individuals with other responsibilities, as was the case in Forest County. The use of university resources, although sometimes fee based, can be done at a lower cost to cover faculty time and project travel expenses than a more costly for-profit consulting firm.

Level of Effort

Because a student team can bring to bear the efforts of multiple students, the ability of each student to put more creative thought and time into completing specific project tasks is greater than what could be expected from professionals with more practical experience or competing priorities. By linking academic grades to a client's expectation for completed deliverables, there is a greater incentive for students to produce the highest quality work possible. University resources can help ensure that community access to information regarding broadband and resulting plans are responsive and of high quality. When universities have a positive reputation with the community, students can build trust more effectively and operate under the legitimacy of the university. With respect to broadband planning in Forest and Beach Counties, this was evident in the thoroughness of the community

outreach process, the comprehensiveness of baseline needs assessment, and the quality of the guidance offered to the communities to expand community outreach and support the LTPT process after the close of the student project.

Educated Community

With costs reduced and the amount of available contact time increased, a student team can conduct more and better-focused outreach efforts than government staff or outside consultants, as evidenced in both Beach and Forest counties. This outreach allows for a more comprehensive sharing of basic information on broadband solutions with the broader community. Students took care to make sure each outreach opportunity had a specific education component to educate the public about the types of connections and speeds. This continuous personal contact builds trust, resolves concerns, and focuses community members on supporting broadband solutions that best suit their needs.

Educated Elected Officials and Staff

Along with creating an effective, nonthreatening avenue for educating the public, the use of students in developing a rural community broadband plan also helps to educate and motivate elected officials and can build capacity among the local government staff. The students are typically seen as a part of the broader regional community, so while they may be viewed as "preprofessionals," their work quality, due to the high standing of the university, is not. Their provision of comprehensive information on technical and legal issues, their recommendations on solutions and costs, and their highlighting of grant resources build a high level of trust.

Relationship Building

Using graduate students to support broadband planning is cost and time-effective and can have many direct benefits beyond developing effective, responsive high-quality plans. As noted, by establishing themselves as accessible and trusted partners, the students can better educate and focus the visions of community members and elected officials on practical solutions. Through the development of useful plans that can help communities access additional resources and address their broadband needs, the students help solidify a mutually beneficial relationship. Through relationships like these, the communities can

become more open to seeking guidance and support from the University system, further increasing their access to up-to-date information on broadband solutions.

Students also benefited from participating in community-based planning:

Hard Skills

Before working on the projects highlighted in this article, none of the students had experience with broadband planning. Completing these projects forced the students to become knowledgeable in communications technology, processes for evaluating community needs, equitable community-based outreach efforts, and the development of actionable plan alternatives. As a result, the students recognize broadband as essential community infrastructure. They are also prepared to enter the workforce on the cusp of a growing area of focus, the equitable provision and management of communications technology.

Soft Skills

Undertaking a project that has as an underlying consideration, a community needs assessment, requires students to engage with the community. The mixed methods approach used in the Beach and Forest County projects involved survey data collection, multivenue community outreach events, and public meetings. It also required students to interact with and educate a diverse selection of community members, from shoppers at a local grocery store to government staff and elected officials. The planner's role is to understand and communicate sometimes complex technical problems, listen to and distill community interests, develop alternative solutions, and advise decision-makers. This project allowed the student to practice each step in that process and build their practical, professional work experience.

Conclusion

In this article, we related a two-phased community broadband planning effort conducted by student teams from a nearby university in two rural counties. Using a parallel structure guided by heuristics drawn from student assignment guidelines and engagement activities, we compared the efforts' implications for broadband planning capacity building for local participants

and university partners. Overall, the efforts illustrated the continuing need to recognize broadband as an essential component of community infrastructure. Just as we could not envision a community without roads, a community without broadband is a community that does not have equal access to the fundamental aspects of our civilization, including telemedicine, social interaction, government services, education, and commerce.

Caveats

Throughout the surveying and outreach process, the research team intended to be representative of all Beach and Forest County residents specifically reflecting diversity in geographic area, race/ethnicity, gender, age, and income. Although care was taken to be representative of the surveyed communities, through reflection on the online administration for the initial phases of the broadband feasibility survey, the research team identified some potential biases and limitations that could be addressed in later efforts. The irony of launching an online broadband survey for those who may not have broadband access was apparent to the research team. Although the survey was administered in person and read aloud to respondents who needed assistance, those most affected by the lack of broadband provision in the counties may not have been successfully engaged. Another study limitation was the lack of engagement with internet providers. The student-led teams reached out to several of the largest internet providers in both counties but could not engage effectively.

Implications for Research and Practice

In the future, additional efforts could be made to partner with local business interests or the chambers of commerce to gather information on these stakeholders, in comparison to the residentially focused survey in this report. A summary of these efforts includes:

- Increase in-person presence and support in most rural locations
- Launch of a business survey
- Translation of survey to reach non-English-speaking households
- Focus even more on target groups, such as Census blocks with higher percentages of non-White populations, poverty rates, and elderly populations within the county.

Rural communities are at a disadvantage in broadband planning. Lack of staff availability from rural county staff and significant knowledge gaps deter effective negotiation with ISPs. Financial resources are also a significant barrier; start-up costs to lay fiber-optic cable are cost prohibitive for rural counties, which makes bringing ISPs to the negotiating table difficult. There is a persistent belief that rural communities are not worth the return on investment for ISPs. Through projects like this example of a university–community partnership, rural county staff can increase their knowledge of the broadband landscape and negotiating power when engaging more knowledgeable ISPs.

While many academic programs have a necessary focus on diversity, equity, and inclusion, underemphasized is a focus on the practical application of these skills in broadband planning to address inequities. Care should be taken to make sure that the community engagement process and the planning recommendations are appropriate for the community that university partners are working with. Rural communities are not one size fits all. Engaging students in the development of community-based broadband plans helps ensure that the planning profession continues to be future focused while building a cadre of new professionals ready to improve education and action around infrastructure planning, not just in rural communities, but nationwide.

APPENDIX

This survey is a preview version of the survey that appeared to residents in Forest and Beach County. Your response will not be recorded.

https://fsu.yul1.qualtrics.com/jfe/preview/previewId/77d34f80-d16f-42ad-a9af-9260ff6e293a/SV_7VblgdoWHU4IOvI?Q_CHL=preview&Q_SurveyVersionID=

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